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observation, nor I, could detect any alteration in the solar spectrum at the edges of the band. The slit of the spectroscope was then shifted by pressure upon the side of the instrument until the slit cut off a small arc or was nearly tangential to the disk of the planet, but no changes in the solar spectrum at the edges of the band could be perceived.

The difficulties of the observation (owing to the small magnifying power and to the atmospheric tremor) were, however, so great that no reliance must be placed on this observation as affording any but the roughest evidence that the planet has not a very large absorbing atmosphere.

In the evening after the transit the collimation of the spectroscope and finder was tested upon a star and found not to have shifted, so that there can be little doubt that the slit was swept over the place of the planet as it came up to external contact.

Observations of the Transit of Mercury, 1878, *May* 6.

By Maxwell Hall, Esq.

(*Extract from a Letter to the Astronomer Royal.*)

The transit of *Mercury* was observed here yesterday under circumstances well worth your consideration. The Ingress was obscured by a cloud, but the Egress showed that no reliance could be attached to the estimated times of the various phases of contact, δ, ε, ζ, geometrical contact and bisection; they were all so linked together that the time of any phase was liable to an error of about 10 seconds.

A party of ladies and gentlemen assembled here to see the transit, and the results are most curious and entertaining. With a low power of 55 most of us saw a ring of light, brighter than the surface of the Sun, surrounding the black disk of *Mercury*; with a higher power of 120 some of us saw both the ring and a bright central spot, some saw only the ring, some only the spot, and some neither. With a power of 200 I myself distinctly saw the spot in the form of a *small* and *narrow ring* of light, concentric with the black disk of *Mercury*, and about 5″ in diameter; but with this power I found that the *exterior ring had vanished.*

The sketch made by Dr. Huggins during the transit of *Mercury* in 1868 (*Monthly Notices*, vol. xxix., p. 27) was carefully compared with what we saw with the intermediate power, and, excepting the eccentric position of the bright spot in that sketch, it was generally approved of as representing our combined descriptions.

There cannot therefore be the least doubt that these appearances are merely optical; and they were only seen by those who had the more delicate eyesight.

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A first-surface solar prism and a dark glass shade were employed; the diameter of the object-glass is 4 inches.

The Observatory, Jamaica,
1878, *May* 7.

Observations of the Transit of Mercury, May 6, 1878, at Princeton, N. Jersey. Lat. 40° 20′ 58″·0 ± 0″·2, *Long.* 9ᵐ 36ˢ ± 1ˢ *E. of Washington.* By Professor C. A. Young.

The instrument used was the new Clark Equatoreal, of 9½ inches aperture, armed with a Merz polarising solar eye-piece. The whole aperture was employed. The magnifying power at the first observation was 155; all the rest were made with a power of 223.

Flying clouds were troublesome, and the seeing was very bad, from the unsteadiness of the air, but the phenomena took place with a rapidity and decisiveness quite in contrast with what I had seen at the transit of *Venus*, so that I think the probable error of the times given cannot much, if at all, exceed one second.

The timepiece used was a sidereal clock beating once in two seconds. Its errors were carefully determined by star observations on the nights preceding and following the transit, and it was compared with the solar clock by means of the chronograph.

The solar clock was also compared with Washington time by means of the telegraphic noon signals which are sent daily to New York. By the kindness of Mr. Merrihew, the Superintendent of the Eastern Division of the Western Union Telegraph Company, these signals were transmitted over the wire which passes into the Princeton office for several days preceding the transit and on the day of the transit. The time was carried from the Telegraph Office to the Observatory by means of a pocket chronometer. The telegraphic comparisons were not, however, quite satisfactory, owing to interruptions from unskilled operators on the line, who broke it continually; but the approximate longitude stated above, and derived from these comparisons, agrees well with that deduced from the coast survey maps.

The first contact (external) at Ingress was noted at

h	m	s		h	m	s		
1	11	35·7	Sid. =	22	14	13·9	Pr. M.T.	Magnifying power 155.

The second contact (internal) at

h	m	s		h	m	s		
1	14	27·7	Sid. =	22	17	05·4	Pr. M.T.	Magnifying power 223.

At 1ʰ 12ᵐ 41ˢ·7 Sid. or 22ʰ 15ᵐ 29ˢ·7 M.T. was noted the

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